

CLAIMS

- 1 1. A troubleshooting mentor system for automatically providing an administrator of a
2 computing environment with diagnostic data and instructions to troubleshoot a selected
3 problem event occurring in the computing environment, wherein said diagnostic data and
4 instructions are specifically designed to provide the information and techniques necessary
5 to enable a administrator troubleshoot the selected problem event.
- 1 2. The troubleshooting mentor system of claim 1, wherein upon selection of said
2 selected problem event, said troubleshooting mentor system automatically retrieves from
3 relevant computing environment entities said diagnostic data.
- 1 3. The troubleshooting mentor system of claim 1, wherein said selected problem event
2 is one of a plurality of problem events generated by domain managers in the computing
3 environment, each said domain manager managing an entity on the computing
4 environment.
- 1 4. The troubleshooting mentor system of claim 1, wherein said troubleshooting mentor
2 system comprises:
3 a problem event processor that causes a display of said plurality of problem events
4 that have occurred, and that determines which of a plurality of a troubleshooting types
5 corresponds to said selected problem event;
6 a troubleshooting profile manager that executes a predetermined troubleshooting
7 profile associated with said troubleshooting type of said selected problem event; and
8 a troubleshooting portal view manager that executes said retrieved troubleshooting
9 profile and one or more troubleshooting data miner modules referenced in said retrieved
10 troubleshooting profile, each said troubleshooting data miner module generating or
11 causing the generation of said diagnostic data and said instructions, wherein said profile
12 manager displays said diagnostic data generated by said referenced one or more
13 troubleshooting data miner modules.
- 1 5. The troubleshooting mentor system of claim 4, wherein said data miner modules
2 include a first data miner module that generates or causes the generation of said

3 troubleshooting instructions, and wherein said troubleshooting portal view manager
4 displays said troubleshooting instructions produced by the execution of said first data
5 miner module.

1 6. The troubleshooting mentor system of claim 3, wherein said computing environment
2 includes a network system, and wherein said domain managers comprise one or more of
3 the group consisting of:

4 network managers that manage individual and collections of networks;
5 software application managers that manage software applications executing on a
6 node or server of the computing environment;
7 database managers that manage databases executing on a node or server of the
8 network system; and
9 server managers that assist a network administrator manage the operations of each
10 server in a network

1 7. The troubleshooting mentor system of claim 3, wherein said problem event
2 processor normalizes said plurality of problem events for display.

1 8. The troubleshooting mentor system of claim 3, wherein said event-type-specific
2 information is displayed in accordance with viewpoint layout information included in said
3 selected troubleshooting profile.

1 9. The troubleshooting mentor system of claim 1, wherein said problem events
2 comprise:

3 problem events automatically-generated by said domain managers; and
4 problem events identified by a user of the computing environment and manually
5 entered into the troubleshooting mentor system.

1 10. The troubleshooting mentor system of claim 1, wherein said display of said
2 diagnostic data can be modified by the administrator inputs specifying a change in said
3 diagnostic data, and wherein said troubleshooting portal view manager accesses said

4 domain managers as necessary to obtain or cause the generation of said modified
5 diagnostic data.

1 11. The troubleshooting mentor system of claim 1, wherein said problem event
2 processor generates event data associated with said selected problem event, said event
3 data including an original event ID generated by the domain manager, said
4 troubleshooting type of said selected problem event, and information pertaining to the
5 source entity that caused the generation of said problem event.

1 12. The troubleshooting mentor system of claim 1, wherein said problem event
2 processor comprises:

3 an event consolidator that receives problem events from domain managers, said
4 problem events generated by different domain managers having different formats, said
5 event consolidator processes said problem events and, in response to each received
6 problem event, generates a normalized event identifier having a standard format; and
7 an event type determinator that categorizes received problem events as being one of
8 a plurality of troubleshooting types, each said troubleshooting type indicating diagnostic
9 data and troubleshooting procedures likely to be required to be performed or analyzed to
10 successfully troubleshoot each said problem event, and which generates said
11 troubleshooting type for said selected problem event.

1 13. The troubleshooting mentor system of claim 1, wherein said problem event
2 processor comprises:

3 an event consolidator that receives problem events from domain managers and that
4 generates a representation of the selected problem event, said representation including
5 said troubleshooting type.

1 14. The troubleshooting mentor system of claim 4, wherein said troubleshooting profile
2 manager comprises:

3 a repository of troubleshooting profiles each associated with a particular
4 troubleshooting type of problem event;

5 a repository of mapping data that associates each said troubleshooting type and one
6 of said troubleshooting profiles;

7 a profile selector that, based on said troubleshooting type of said selected problem
8 event, retrieves from said repository one of said troubleshooting profiles that is to be
9 implemented for said selected problem event; and

10 a profile conditioner that populates said retrieved troubleshooting profile with at
11 least a portion of said event data.

1 15. The troubleshooting mentor system of claim 4, wherein said troubleshooting profile
2 is an extensible, executable software program that invokes a pre-determined combination
3 of data miners that generate or cause the generation of context-sensitive troubleshooting
4 data and instructions to assist the administrator diagnose and correct the cause of said
5 selected problem event.

1 16. The troubleshooting mentor system of claim 14, wherein said repository of mapping
2 data is a look-up-table.

1 17. The troubleshooting mentor system of claim 14, wherein said troubleshooting
2 profile manager further comprises:
3 a troubleshooting profile editor that enables the administrator to modify, add or
4 delete the contents of said mapping data and said database of said troubleshooting
5 profiles.

1 18. The troubleshooting mentor system of claim 14, wherein each said troubleshooting
2 profile comprises:

3 portal view layout information for use by troubleshooting portal view manager and
4 troubleshooting GUI in the generation of a TS view window;

5 one or more references to troubleshooting data miner modules that are to be utilized
6 to obtain diagnostic data and instructions relevant to troubleshooting selected problem
7 event; and

8 troubleshooting data miner module configuration information parameters that
9 provide requisite information to said one or more referenced troubleshooting data miner
10 modules.

1 19. The troubleshooting mentor system of claim 4, wherein said troubleshooting portal
2 view manager comprises:

3 a database of said troubleshooting data miner modules;
4 a data miner manager that invokes said one or more troubleshooting data miner
5 modules referenced in said troubleshooting profile; and
6 a portal view window generator that displays said diagnostic data and said
7 troubleshooting instructions generated by said referenced data miner modules in
8 accordance with said portal view layout information contained within said
9 troubleshooting profile.

1 20. The troubleshooting mentor system of claim 19, wherein said troubleshooting data
2 miner modules are executable software programs that, when executed, access, call, query,
3 or otherwise interface with external entities to retrieve or cause the generation of
4 diagnostic data and troubleshooting instructions.

1 21. The troubleshooting mentor system of claim 4, wherein said troubleshooting data
2 miner modules comprise one or more of the group consisting of:
3 software programs that mine data from the database of one or more domain
4 managers;
5 software programs that access knowledge databases provided by a customer of the
6 computing environment; and
7 software programs that call or invoke system utilities and tools that, when executed,
8 generate said diagnostic data.

1 22. The troubleshooting mentor system of claim 4, wherein said computing environment
2 comprises a distributed network system.

1 23. An apparatus that displays context-sensitive troubleshooting information relevant to
2 the diagnosis of a particular problem event occurring a computing environment, wherein
3 said troubleshooting information includes instructions for troubleshooting said particular
4 problem event, and wherein said context-sensitive troubleshooting information is
5 generated automatically and without network administrator action subsequent to
6 identifying said particular problem event.

1 24. The apparatus of claim 23, wherein said context-sensitive troubleshooting
2 information relevant to said particular problem event includes diagnostic data for
3 assisting a network administrator in diagnosing said particular problem event.

1 25. The apparatus of claim 24, wherein said diagnostic data is retrieved automatically
2 from a management device that manages one or more network entities.

1 26. The apparatus of claim 24, comprising:
2 a database of troubleshooting data miner modules each generating or causing the
3 generation of one of either troubleshooting instructions and diagnostic data;
4 a repository of troubleshooting profiles each referencing one or more data miner
5 modules that result in the generation of troubleshooting instructions and diagnostic data
6 for a particular type of problem event;
7 a memory device in which is stored data that associates each said problem event
8 type with a troubleshooting profile; and
9 a troubleshooting software module that displays problem events received from
10 domain managers and that determines said type of a problem event selected by an
11 administrator, retrieving a troubleshooting profile from said repository that is associated
12 with said type and executing same to cause the invocation of said referenced
13 troubleshooting data miner modules, displaying said diagnostic data and troubleshooting
14 instructions generated by said referenced troubleshooting data miner modules.

1 27. A method for displaying context-sensitive information relevant to a particular
2 problem event occurring in an entity of a computing environment, comprising:

- 3 A) receiving a selected problem event;
- 4 B) generating contextual instructions and diagnostic data pertinent to
- 5 troubleshooting the particular problem event; and
- 6 C) displaying said instructions and said diagnostic data on a display device.

1 28. The method of claim 27, wherein receiving a selected problem event comprises:

- 2 1) receiving a plurality of problem events each generated by a domain manager
- 3 residing in the computing environment;
- 4 2) storing said received problem events in a repository of problem events that
- 5 have occurred in the computing environment;
- 6 3) displaying said plurality of stored problem events in an interactive display;
- 7 4) receiving an network administrator selection of one of the displayed problem
- 8 events; and
- 9 5) generating an output indicating which of said plurality of problem events is
- 10 said selected problem event.

1 29. The method of claim 27, wherein generating contextual diagnostic data pertinent to
2 troubleshooting the particular problem event comprises:

- 3 1) determining which type of problem event is said selected problem event; and
- 4 2) determining which troubleshooting diagnostic data and instructions to display
- 5 based on said type of said selected problem event.

1 30. The method of claim 29, wherein determining which troubleshooting diagnostic data
2 to display comprises:

- 3 a) providing a database of troubleshooting data miner modules, each said
- 4 troubleshooting data miner module generating or causing the generation of diagnostic
- 5 data or instructions related to a particular network entity or function;
- 6 b) generating a database of troubleshooting profiles each referencing a
- 7 predetermined one or more troubleshooting data miner module to display diagnostic data
- 8 and troubleshooting instructions pertinent to a particular type of problem event;

- 9 c) retrieving from said database of troubleshooting profiles a troubleshooting
10 profile associated with said type of said selected problem event; and
11 d) invoking said retrieved troubleshooting profile and said one or more
12 troubleshooting data miner modules referenced therein.

1 31. A method for displaying context-sensitive information relevant to a particular
2 problem event occurring in an entity of a computing environment, comprising:

3 A) displaying a representation of a plurality of problem events that have occurred
4 in computing environment;

5 B) receiving an network administrator selection of one of the displayed problem
6 event representations; and

7 C) displaying, in response to said network administrator selection, diagnostic data
8 pertinent to troubleshooting said selected problem event and instructions informing the
9 network administrator how to troubleshoot said selected problem event.

1 32. The method of claim 31, further comprising:

2 D) displaying graphical display elements representing additional, more detailed
3 information;

4 E) receiving an network administrator graphical selection of once such graphical
5 display element; and

6 F) displaying said addition, more detailed information represented by said
7 selected display element in response to said network administrator graphical selection.

1 33. The method of claim 31, wherein when said selected display element appears in
2 association with a troubleshooting instruction, said additional information includes one or
3 more of the group consisting of information describing the associated troubleshooting
4 step, sub-steps that can be taken to perform the troubleshooting step, references to
5 external documentation pertaining to said troubleshooting step or network entities.

1 34. The method of claim 31, wherein when said selected display element appears in
2 association with a diagnostic data, said additional information includes one or more of the
3 group consisting of additional, more detailed diagnostic data, instructions regarding how
4 the diagnostic data is to be interpreted.

1 35. A computer program product comprising a computer readable medium having
2 computer program logic recorded thereon for enabling a processor in a computer system
3 to automatically display diagnostic data and instructions on how to troubleshoot a
4 selected problem event, wherein said diagnostic data and instructions are specifically
5 relevant to troubleshooting said selected problem event.

1 36. The computer program product of claim 35, wherein said computer readable
2 medium comprises:
3 a database of said troubleshooting data miner modules each generating or causing
4 the generation of one of either troubleshooting instructions and diagnostic data;
5 a repository of troubleshooting profiles each referencing one or more data miner
6 modules that result in the generation of troubleshooting instructions and diagnostic data
7 for a particular type of problem event; and
8 a memory device in which is stored data that associates each said problem event
9 type with a troubleshooting profile; and
10 wherein said computer program logic enables the processor to display problem
11 events received from domain managers on the network and that determines the type of a
12 problem event selected by a user and retrieves a troubleshooting profile from said
13 repository that is associated with said type, and that executes said retrieved
14 troubleshooting profile causing the invocation of said referenced troubleshooting data
15 miner modules, displaying said diagnostic data and troubleshooting instructions generated
16 by said referenced troubleshooting data miner modules.

1 37. A program storage device readable by a machine, tangibly embodying a program of
2 instructions executable by the machine to perform method steps for displaying context-
3 sensitive information relevant to a particular problem event occurring in an entity of a
4 computing environment, comprising:
5 A) receiving a selected problem event;
6 B) generating contextual instructions and diagnostic data pertinent to
7 troubleshooting the particular problem event; and
8 C) displaying said instructions and said diagnostic data on a display device.

1 38. The program storage device of claim 37, wherein receiving a selected problem event
2 comprises:

- 3 1) receiving a plurality of problem events each generated by a domain manager
4 residing in the computing environment;
- 5 2) storing said received problem events in a repository of problem events that
6 have occurred in the computing environment;
- 7 3) displaying said plurality of stored problem events in an interactive display;
- 8 4) receiving an network administrator selection of one of the displayed problem
9 events; and
- 10 5) generating an output indicating which of said plurality of problem events is
11 said selected problem event.

1 39. The program storage device of claim 37, wherein generating contextual diagnostic
2 data pertinent to troubleshooting the particular problem event comprises:

- 3 1) determining which type of problem event is said selected problem event; and
- 4 2) determining which troubleshooting diagnostic data and instructions to display
5 based on said type of said selected problem event.

1 40. The program storage device of claim 39, wherein determining which troubleshooting
2 diagnostic data to display comprises:

- 3 a) providing a database of troubleshooting data miner modules, each said
4 troubleshooting data miner module generating or causing the generation of diagnostic
5 data or instructions related to a particular network entity or function;
- 6 b) generating a database of troubleshooting profiles each referencing a
7 predetermined one or more troubleshooting data miner module to display diagnostic data
8 and troubleshooting instructions pertinent to a particular type of problem event;
- 9 c) retrieving from said database of troubleshooting profiles a troubleshooting
10 profile associated with said type of said selected problem event; and
- 11 d) invoking said retrieved troubleshooting profile and said one or more
12 troubleshooting data miner modules referenced therein,